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Environmental knowledge and Waste Disposal Attitude Among Undergraduates in Calabar Education Zone, Cross River State, Nigeria

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Abstract
This study investigated the relationship between environmental knowledge and waste disposal attitude among undergraduates in Calabar Education Zone of Cross River State, Nigeria. The investigated sub-independent variables were knowledge of waste disposal methods and knowledge of the physical environment while the dependent variable was waste disposal attitude among undergraduates. Available and relevant literature was reviewed based on the study's variables. A survey research design was used for the study. A sample of 702 respondents was drawn using stratified and proportionate random sampling techniques. A data collection instrument titled "Environmental Knowledge and Waste Disposal Attitude Questionnaire" (EKWDAQ) was used to elicit data for the study. Cronbach Alpha was applied to estimate the instrument's reliability. Pearson Product Moment Correlation (PPMC) and tested at .05 level of significance. The findings revealed that knowledge of waste disposal methods and knowledge of the physical environment were found to be significantly related to waste disposal attitude among undergraduates. Recommendations included that undergraduates should be made to have more awareness of waste disposal methods in the school by the positioning of numerous banners and billboards indicating waste disposal methods deemed appropriate and those that are inappropriate within the school.
Key words: Attitude, environmental knowledge, waste disposal, physical environment

Introduction
Waste disposal involves the collection, transportation and disposal of garbage and other waste items in a very proper manner. It is the process of treating solid wastes and provides series of solutions for recycling products that belong to trash. Waste disposal is essential for the sanitation of cities and health of the citizens. Proper waste disposal includes landfills, burning/incineration and recycling as the mentioned methods are not deleterious to natural ecosystems as compared to others such as open dumping (Deress, Jemal, Girma & Adane, 2019). Globally, landfills are the most common system, usually involves using pits located at distance from developed areas to bury wastes to avoid its harmful effects. Combustion is the process where hazardous air contaminants are released by the burning of wastes, arousing serious concerns with regards to environmental pollution. Recycling is the way of converting waste products into new products through certain

reactionary processes to avoid energy usage and consumption of fresh raw materials. It is the third component of Reduce, Reuse and Recycle of waste hierarchy.

Proper waste disposal is of imminent importance to both man and the environment, and it is critical to public health and the environment in that it helps to maintain a healthy environment thus reducing the chances of epidemics. Proper waste disposal reduces the probability of contamination of soil and ground water, drainage blockages and erosion. Educating people on the need to protect the environment is of great essence as improper waste disposal which potentially endangers man in many ways is now a global concern. Educating people repeatedly about the benefits of proper waste disposal cannot stop because people usually forget the right actions they are to take regarding wastes as time progresses (Desa, Kadir & Yusooff, 2011).

Within the study area, attitude towards waste generation and disposal attitude among undergraduates has become a modern-day dilemma which could be likened to unsophisticated and low level of knowledge/awareness to handle waste. Despite efforts by the school to provide waste bins and dumpsters, sights of littered wastes/garbage heaps are very common. Littering of waste generated by students whether in a classroom or moving within school appears to be a normal thing even when the student is beside a waste bin/dumpster. Sitting in a littered class for most students waiting for lectures or even during the lecture is often not an issue. In some classrooms, heaps of garbage within the class can stay there for days on end without care and/or concern by students for its evacuation. Being an environment associated with institutional, residential, commercial, agricultural and construction sectors, the wastes generated and improperly disposed include food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, metals, ashes, special wastes (e.g. bulky items, consumer electronics, white goods, batteries, oil, tires), household hazardous waste, street sweepings and agricultural wastes. Aside classrooms, hostels, walkways, drainages, libraries, conference centres, sport fields, resource rooms, etc are not spared the littering spree/sights of refuse. Also, there seems to be no favourable disposition by the students towards forming waste disposal clubs to aid the school's efforts towards a clean school environment. All this is despite having been educated on proper waste disposal methods at both primary and secondary school levels.

Appropriate waste disposal practices amongst undergraduates are pertinent for many reasons. Firstly, is the aesthetics of the environment. An unclean environment is not only an eyesore but also promotes ill-health to persons living within such areas. Secondly, researches have proven that unclean environments such as the numerous sites within school with the refuse/garbage heaps serve as breeding grounds for vermin and disease-causing agents (Abdurrahman & Alhassan,

2022). This could imply that the study area is fast turning into an industrial breeding ground for vermin and other disease-causing agents. Thirdly, such sites are synonymous with the production of leachates which seep into the soil thus contaminating it. Fourthly, such sites are sources of air pollution and fire outbreaks as the numerous gases such as methane, carbon dioxide, hydrogen sulphide and mercury vapour which emanate out from the decaying waste are proven environmental pollutants (Adogu, Uwakwe, Egenti, Okwuoha & Nkwocha, 2015).

There are many factors that can possibly be linked to waste disposal attitude among undergraduates in schools. Environmental knowledge which refers to an individual's cognitive ability to be aware of his/her environment is one possible factor. It helps enrich an individual with the knowledge to recognize the threats and imbalances which the environment faces and enables the person for positive attitudes towards it with the aim of imbibing skills to resolve, prevent, protect and improve the environment both for the present and future generations (Stern, 2000). The indicators of environmental knowledge include knowledge of waste disposal methods and knowledge of the physical environment.

As a variable, knowledge of waste disposal methods refers to the cognitive awareness levels of students towards the various ways of disposing waste. Some surveys have shown that this variable can have a possible connection with students' attitudes towards waste disposal (Molina & Catan, 2021; Erhabor, 2023). Knowledge of the physical environment as a variable refers to students' cognitive awareness levels of physical structures, facilities and equipment related to appropriate and inappropriate waste disposal practices. Also inclusive here is awareness of rules and regulations concerning inappropriate waste disposal practices in school. For this variable, certain studies have shown that this variable has a possible connection with students' waste disposal attitudes (Iyama, Edori & David, 2020; Yusuf & Fajri, 2022). From the foregoing, the need arose for an investigation of environmental knowledge and waste disposal attitude among undergraduates in Calabar Education Zone, Cross River State.

Statement of the problem

The aim of the National Policy Guideline on School Sanitation is to provide an optimal sanitary environment which is safe and conducive for physical, mental and emotional health of the school community in order for the child to achieve maximum benefits from the educational programmes. In line with the above, it is expected that students who progress from secondary school into higher institutions in recent times should show a level of knowledge in terms of appropriate waste disposal attitudes and habits. The provisions of the Policy involve making students aware of the importance of appropriate sanitary and hygiene practices, waste disposal attitudes, environmental awareness, etc. Aside the awareness creation, the Policy is also designed to encourage the learners inculcate and practice appropriate sanitation and hygiene practices as habits.

Universities in Calabar Education Zone (University of Calabar and Cross River University of Technology) are burdened with indiscriminate waste disposal (littering) as undergraduates prefer to litter the school environment with their waste even when close to a waste bin/dumpster. This showing a seeming lack of understanding towards the essence of appropriate dropping of waste in the waste bins/dumpsters provided. In addition, most students would prefer to drop their wastes in gutters without caring that the gutter is meant for channelling water. Classrooms and everywhere there are undergraduates are not spared the littering spree. These actions leave an observer with the belief that though undergraduates are aware of the need to maintain a clean environment, they depict no iota of feelings or concern towards a sustainable clean school environment. In addition, their actions leave an observer to believe that they lack knowledge of, and for the environment, and subsequently lack the willingness to imbibe and display good waste disposal attitudes.

Lastly, indiscriminate waste littering around the campuses by undergraduates make it difficult to have fresh air around most classrooms and their surroundings. They have also served as blockages to gutters in areas where the waste dumping is very prevalent, resulting in flooding and spreading of diseases and infections such as guinea worm, diarrhoea, typhoid, cholera and dysentery. It is on this basis that this study investigated the correlation between environmental knowledge and waste disposal attitude among undergraduates in Calabar Education Zone, Cross River State.

Purpose of the study

The purpose of the study was to investigate the relationship between environmental knowledge and waste disposal attitude among undergraduates in Calabar Education Zone of Cross River State, Nigeria.

Research questions

1. To what extent does knowledge of waste disposal methods relate with waste disposal attitude among undergraduates?
2. How does knowledge of the physical environment relate with waste disposal attitude among undergraduates?

Statement of hypotheses

1. Knowledge of waste disposal methods has no significant relationship with waste disposal attitude among undergraduates
2. There is no significant relationship between knowledge of the physical environment and waste disposal attitude among undergraduates

Literature Review

There are numerous waste disposal methods in which people engage in to dispose their waste. According to Amasuomo and Baird (2016), and Ogunmakinde, Sher and Maund (2019), they include recycling, incineration, composting, land-filling, open dumping, burning, reuse and pyrolysis. Starting with recycling, it is described as the end-of-life recovery of a material's value and its reprocessing into a new product for continuous usage in its primary or secondary state (Ike, Ezeibe, Anijiofor & Daud, 2018). This method ensures that the consumption of finite resources is reduced, while the potential resources are conserved. Its disadvantages include the neglect of product's quality and efficiency and the lack of energy recovery. Incineration as a waste disposal method involves the disposal of wastes by means of combustion at high temperature, which could be through the central system or on-site (Olayiwola, Itohan & Abiodun, 2023). It advantages include waste reduction, production of electricity, and heat energy, while on the other hand, the method contributes to pollution in the form of acid rain and ash production.

As a waste disposal method, composting refers to the use of natural microbial organisms in organic waste decomposition. Its disadvantages include contributing to global warming by producing carbon dioxide, and its inability to handle plastic and glass related-waste. Landfill which is a very common, cheap and economical method simply refers to a designated space/piece of land where waste materials are buried. Landfills are usually for a specific period of time and comprise two types - sanitary and natural attenuation (Nwosu & Chukwueloka, 2020). It serves to provide job opportunities for scavengers and generates energy from the gases produced by the wastes. On the other hand, its disadvantages far outweigh its advantages socially and environmentally. For example, it is associated with adverse health effects and leachates produced form the landfills cause ground water contamination and air pollution. Another common and cheap method is open dumping. This method simply involves wastes being carelessly dumped in open spaces, most often undesignated spaces such as road side kerbs, gutters, and even in front of markets. Aside being a cheap option, this method no other advantage, rather it has a myriad of disadvantages, which include those associated with landfills (Ndukwe, Uzoegbu, Ndukwe & Agibe, 2019).

Burning as a waste disposal method is very similar to open dumping, with the slight difference being that of setting wastes on fire. Its advantage and disadvantages are very similar to that of open dumping though it contributes more to air pollution and global warming due to emission of gases from the burning of wastes. Reuse as a method refers to any activity in which a "perceived substance" deemed to be waste is used again for the purpose for which they were conceived (Shegow & Funwie, 2020). Its advantages include reduction of wastes in an efficient manner, thereby contributing to a reduction of greenhouse gas emissions and air pollution. Socially and economically, it enhances social interaction and reduces the cost of producing new materials.

Pyrolysis (often an alternative to incineration) involves the thermal decomposition of materials at very high temperatures and in the absence of oxygen (Ogunmakinde *et al*., 2019). Its pros include reduction of waste volume, degradation of toxic components, and production of gases which can be used as fuel. Its cons however, include production of ashes which contaminate the air, thereby causing pollution and being a very costly venture, it is not viable in poor countries. From the foregoing, aside reuse and recycling, all the other waste disposal methods are not environmental friendly, thus they are not sustainable waste disposal methods.

Based on the unsustainable nature of most waste disposal methods, the United Nations Environmental Programme (UNEP) proposed the hierarchy of waste management model which is modeled around the 3Rs of reduce, reuse and recycle (Amasuomo & Baird, 2016). The 3Rs refer to the reduction in the amount of waste being generated, the reuse of items prior to their being commissioned as waste, and the recycling of items once they become waste (Iorhemen, Alfa & Onoja, 2016). An expounded version of this in the waste management hierarchy includes - waste prevention/reduction, reuse, recycling &composting, energy recovery, and finally land-filling (UNEP, 2005a). The hierarchy's function is to aid in the management of waste whilst ensuring little impact on the environment; as such, it is employed in the development of policies for resource management, for handling challenges of landfill scarcity, pollution control (of water and air), and to safeguard public health (UNEP, 2005b). In most nations, prioritization of components in the hierarchy is alike- giving preference first to waste prevention, then reuse, recycling (including composting and material recovery), energy recovery and reduction of waste via methods such as incineration and finally land-filling.

An evaluation of college students' knowledge and attitudes toward solid waste management in Nigeria was carried out by Dung, Mankilik and Ozoji (2017). The population was made up of students in schools in the country's north-central geopolitical region. Two of the study's research questions were concerned with evaluating the students' knowledge level of, and attitude towards solid waste management, respectively, while one the hypotheses was designed to test the relationship between their knowledge of, and attitude towards solid waste management. The result showed that the students generally had a low level of knowledge of solid waste management. In terms of attitudes towards solid waste management, 52.6% revealed positive attitudes while 47.4% revealed negative attitudes. Lastly, it was revealed that a weak positive correlation existed between the students' knowledge and attitude towards solid waste management, this implying that their knowledge of solid waste management had a weak link with their attitude towards management of solid waste. Uwamwezi (2018) probed knowledge, attitude and practices on waste management in selected schools in Kenya. Students of schools in the country's Nairobi County served as the

population. One of the study's hypotheses was to ascertain that students' knowledge of waste disposal methods does not have a relationship with their waste management practices. It was revealed that knowledge of waste disposal methods did have a significant relationship with attitude towards waste management practices.

Ojong, Egbonyi and Akpo (2019) investigated psycho-demographic variables and senior secondary school students' perception of solid waste management in Nigeria. The population consisted of students across schools in Cross River State. The study's objectives included verifying the students' attitudes (categorized into positive and negative) towards their knowledge of how wastes were handled within the state's capital metropolis (Calabar Metropolis). The result revealed that there was a significant difference between their attitudes as it concerned their knowledge of how wastes were handled. Plastic waste sorting intentions among students in Nigerian universities was conducted by Aikowe and Mazancová (2021). Students of schools in the country's western region constituted the population. One of the study's hypotheses was to determine whether students' knowledge of recycling and waste sorting would positively impact on their attitudes towards engaging in the waste disposal practices of sorting and recycling. It was revealed that students' knowledge of the practices would not have a positive impact on their attitudes to engage in the practices. Molina and Catan (2021) examined solid waste management awareness and practices among senior high school students in state colleges in the Philippines. All students of a school in the country's Zamboanga City formed the population. The study's enquiries included ascertaining the students' extent of knowledge as it concerns solid waste management and their corresponding attitudes towards waste segregation, reduction, reuse and recycling. The result revealed that the students did have very encouraging knowledge levels of solid waste management practices.

Praimee and Boonserm (2021) examined the effects of learning activities on waste and sewage management among undergraduates in Thailand. The population consisted of students in schools across the country's Kantharawichai District. One of the study's aims was to ascertain the students' knowledge levels of waste control/sewage management and their responses to volunteer (willingly and unwillingly) towards waste management responsibilities in school. The result showed that there was a significant difference between the students' knowledge levels as it concerned willingness and unwillingness to volunteer for responsibilities towards waste management responsibilities in school. Abdurrahman and Alhassan (2022) assessed students' knowledge and attitudes towards solid waste management in Federal Colleges of Education in Nigeria. Students of schools in the country's north-west geo-political zone formed the population. The study's enquiries included ascertaining the extent of awareness of the students towards waste disposal methods, and the effect of their awareness on their attitudes towards waste disposal. Data analysis showed that the students had an above average level of awareness towards waste disposal

methods and also, their awareness levels had an above average effect on their attitudes waste disposal.

A survey on attitude of undergraduates towards waste management in non-residential tertiary institutions in Nigeria was conducted by Soluade and Sofadekan (2022). The population of the study comprised students of schools in Osun State. Two of the study's posers were concerned with verifying the students' awareness of waste disposal methods and their waste disposal tendencies. The result revealed that the students were aware of waste disposal methods such as burning (incineration), open dump (including littering, dumping in gutters when it is raining or not), land-filling and use of waste bins. Coincidentally, their disposition towards waste disposal was reflected on their awareness of waste disposal methods as they mostly engaged in the aforementioned methods which they were aware of.

Erhabor (2023) verified the impact of environmental education on the knowledge and attitude of Nigerian undergraduates towards waste segregation. The population comprised of students of a university in Edo State. The study's aim was to examine extent which exposure and non-exposure to environmental education content brought about a difference in each of knowledge and attitude towards waste segregation and minimization. The result showed a significant difference between the experimental and control groups with the former outscoring the latter. Nwadimkpa and Onyeaso (2023) investigated the constraints to environmental hygiene practices among boarding students in Nigeria. Students of schools across Anambra State composed the population. The study's purpose included assessing the students' constraints towards waste management as a sub-component of environmental sanitation. It was revealed that most of the students not only reported low levels of knowledge concerning importance of waste management but also stated that they were not favourably disposed towards engaging in waste management practices.

Akeh and Shehu (2018) examined solid waste disposal and management problems in polytechnics in North-East Nigeria. Study's population was made up of students in a polytechnic in Borno State. The study's objectives included investigating awareness of the various waste disposal equipment in the school and their attitude towards using the available waste disposal equipment. The result showed that the respondents displayed very good awareness of the various waste disposal equipment in the school. Also, they did express very appreciable attitudes towards use of the waste disposal equipment. Sanitation practices among undergraduate students in Nigerian universities were examined by Igudia and Agbonifoh (2019). The study's population was made up of all students of a school in Edo State. The study's aims involved ascertaining knowledge of available sanitation/waste disposal facilities and equipment in the school and their attitude towards

sanitation/waste disposal. The result showed that the students did have a very good knowledge of the available sanitation/waste disposal facilities and equipment in their school. Also, the result showed that the students harboured very good sanitation/waste disposal attitudes.

Chukwu and Osaigbovo (2020) ascertained levels of environmental awareness in selected tertiary institutions and their responses to cleanliness culture in Nigeria. Undergraduates of schools in Edo State formed the study's population. The study's aims included examining the students' level of awareness of types of waste disposal equipment and facilities provided in the schools for disposing waste, and their disposition towards supporting the cleanliness culture of their school's environment. The result showed that the 62% of the respondents were aware of the types of waste disposal equipment/facilities provided within their school. In terms of disposition towards cleanliness culture of their school's environment, on the average, 47.76% of the respondents showed positive disposition towards supporting their school's cleanliness culture. Etor, Hart, Nwabudike and Opurum (2020) investigated knowledge of environmental sanitation among Nigerian secondary school students. Students of schools across Rivers State composed the study's population. The study's aims included examining the students' knowledge of the variety of waste disposal equipment and facilities, and their disposition towards environmental sanitation in their schools. The result revealed that 79.7% of them did have a good knowledge of the variety of waste disposal equipment/facilities and also, a similar number displayed favourable dispositions towards environmental sanitation in their schools.

Iyama, Edori and David (2020) assessed waste management strategies among staff and students in Nigerian Colleges of Health Science and Technology. Staff and students of a school in Rivers State made up the study's population. The study's objectives involved verifying knowledge of waste disposal equipment/facilities within the school and their disposition towards appropriate waste disposal practices. The result showed that the respondents did have very good knowledge of waste disposal equipment/facilities within the school. It was also revealed that the respondents did harbour very good dispositions towards appropriate waste disposal practices. Students' awareness and attitudinal dispositions to e-waste management practices at a Zimbabwean university was conducted by Maphosa (2021). Students of a school in the country's city of Bulawayo served as the population. The study's objectives included examining knowledge of physical equipment/facilities for e-waste disposal and their attitudes towards e-waste disposal. The result revealed that the students did have above average knowledge of physical equipment/facilities for e-waste disposal but rather had generally poor attitudes towards e-waste disposal.

Assessment of students' perception and attitude towards solid waste management in Nigerian universities was investigated by Amarachukwu, Evuti, Salam and Silas (2022). The study's

population comprised of all undergraduates of a university in Abuja. The study's posers included examining awareness of waste disposal equipment available in the school and their disposition towards waste disposal. The result showed that the students were very aware of the waste disposal equipment available in the school but on the other hand, only 45.8% of them displayed good waste disposal attitudes. Salihu, Salihu, Adamu, Giade and Idris (2022) assessed the use of dustbin on solid waste management practices in public secondary schools in North-Eastern States in Nigeria. Students of schools across Bauchi, Yobe and Gombe States served as the study's population. The study's objectives included verifying students' knowledge of waste bins, and their attitude towards its use for waste disposal. The result revealed that the students had very poor knowledge of waste bins, and also, they displayed equally very poor attitude towards their use.

Differences in behaviour, engagement and environmental knowledge on waste management for Indonesian science and social students through the campus program were identified by Yusuf and Fajri (2022). Undergraduates of a school in the country's Aceh region formed the study's population. Two of the study's posers were concerned with examining their attitude towards waste management and knowledge of physical structures and equipment that are used for waste management. The result revealed that the students did have good attitudes towards waste management, and equally good knowledge of physical structures/equipment for waste management. Evaluation of the knowledge, attitude and practices towards plastic waste as environmental nuisance of Vietnamese undergraduates was conducted by Nhi and Giao (2023). The study's population consisted of students from a school in the country's Ninh Kieu District. The study's enquiries included ascertaining the students' knowledge of plastic waste disposal related facilities and equipment, and their disposition towards compliance with regulations regarding plastic waste. The result indicated that the students had very appreciable knowledge of plastic waste disposal related facilities and equipment. It was also revealed that the students had very good dispositions towards compliance with regulations as it concerns plastic waste.

Methodology

The study adopted a survey research design. The target population for the study were the 2019/2020 and 2020/2021 academic session students in selected Departments across Faculties of Arts & Social Science Education, Educational Foundation Studies and Vocational & Science Education in the University of Calabar, the Faculty of Education in the University of Cross River State (UNICROSS), and the Schools of Vocational Education and Science Education in COE. From records obtained from the two schools, the target population is 4,046 students. The reason for students of Faculties of Education only was that the researcher was focused on investigating "would be" teachers only (details shown in Table 1). From the population, a sample of 702

respondents was drawn using stratified and proportionate random sampling techniques. The data collection instrument was tagged the "Environmental Knowledge and Waste Disposal Attitude Questionnaire" (EKWDAQ). It has sections A and B. Section A is concerned with respondents' demographics. Section B elicited responses concerning environmental knowledge {6 items per sub-section totalling 24 items} on a response rubric of very well (VW), not too well (NTW), somehow (SH) and not at all (NAA) and attitude towards waste disposal {8 items} on a response rubric of always (A), most of the time (MOT), sometimes (S) and rarely (R), thus the instrument has a total of 32 items.

The instrument was validated by two experts in Measurement and Evaluation in the Department of Educational Foundations and two experts in the Department of Environmental Education who ascertained the degree to which the items on the instrument measured what it is expected to measure. The reliability of the instrument was ascertained by conducting a trial test with 30 respondents not part of the sample and the obtained data was analysed using the Cronbach Alpha reliability method. The reliability coefficients for each of knowledge of waste disposal methods and physical environment were .77 and .75, respectively while that for waste disposal attitude was .83. The data collection for the study was done by the researchers in conjunction with 4 research assistants lasted about 8 weeks. The data collected were analysed using Pearson Product Moment Correlation (PPMC) technique and tested at .05 level of significance.

Table 1: Breakdown of target student population for the study

Department/Unit	COE (2019/2020 & 2020/2021)	UniCal (2019/2020 & 2020/2021)	UniCross (2019/2020 & 2020/2021)	Total
Agric/Business Education	101	181	379	661
Arts Education	-	289	-	289
Biology Education	-	35	22	57
Curriculum & Instruction	-	203	147	350
Educational Admin. & Planning	-	462	443	905
Environmental Education	-	187	-	187
Guidance & Counselling	-	232	446	678
Human Kinetics & Health Education	63	167	-	230
Mathematics Education	13	42	-	55
Social Science Education	102	532	-	634
TOTAL	279	2,127	1,290	4,046

Source: Admission Records Unit of the COE, the University of Calabar and the University of Cross River State (2023)

Presentation of results

Ho_1

The first hypothesis stated that knowledge of waste disposal methods has no significant relationship with waste disposal attitude among undergraduates. To test this hypothesis, knowledge of waste disposal methods and waste disposal attitude among undergraduates were compared using PPMC. The result of the analysis is presented in Table 2.

Table 2: PPMC analysis of knowledge of waste disposal methods and waste disposal attitude (N=696)

Variables	$\bar{x}$	SD	r	p-level
Knowledge of waste disposal methods (X)	17.26	1.98	.445*	.000
Waste disposal attitude (Y)	22.71	2.32		

*Significant at .05. p<.05; critical r-value=.088.

The result of the analysis in Table 2 revealed that knowledge of waste disposal methods produced a mean score of 17.26 with a standard deviation of 1.98 while waste disposal attitude among undergraduates produced a mean score of 22.71 with SD of 2.32. The result further revealed that the calculated r-ratio of .445 obtained with a p-value of .000 is greater than the critical value of .088 and this met the condition required for significance at the .05 level. Hence, the null hypothesis that knowledge of waste disposal methods has no significant relationship with waste disposal attitude among undergraduates was rejected. With the obtained value of .445, it indicated that knowledge of waste disposal methods had a significant positive relationship with waste disposal attitude among undergraduates.

Ho_2

The second hypothesis stated that there is no significant relationship between knowledge of the physical environment and waste disposal attitude among undergraduates. To test this hypothesis, knowledge of the physical environment and waste disposal attitude among undergraduates were compared using PPMC. The result of the analysis is presented in Table 3.

Table 3: PPMC analysis of knowledge of the physical environment and waste disposal attitude (N=696)

Variables	$\bar{x}$	SD	r	p-level
Knowledge of the physical environment (X)	16.67	1.81	.328*	.000
Waste disposal attitude (Y)	22.71	2.32		

*Significant at .05. p<.05; critical r-value=.088.

The result of the analysis in Table 3 revealed that knowledge of the physical environment produced a mean score of 16.67 with a standard deviation of 1.81 while waste disposal attitude among undergraduates produced a mean score of 22.71 with a standard deviation of 2.32. The result further revealed that the calculated r-ratio of .328 obtained with a p-value of .000 is greater than the critical value of .088 and this met the condition required for significance at the .05 level. Hence, the null hypothesis that there is no significant relationship between knowledge of the physical environment and waste disposal attitude among undergraduates was rejected. With the obtained value of .328, it indicated that knowledge of the physical environment had a significant positive relationship with waste disposal attitude among undergraduates.

Discussion of findings

The result of the first hypothesis showed that knowledge of waste disposal methods has a significant relationship with attitude towards waste disposal among university students. This meant that the students' fluid mix of experience, related information, and expert insight which provides a platform for evaluating and integrating new experiences and information had a statistically significant connection with their attitude towards waste disposal in school. The finding of this study is in agreement with those of Ojong, Egbonyi and Akpo (2019), Aikowe and Mazancová (2021), Soluade and Sofadekan (2022), and, Nwadimkpa and Onyeaso (2023) who all revealed that students' knowledge of waste disposal methods was linked to their dispositions towards waste disposal.

For the study's second hypothesis, the alternate hypothesis was accepted that there is a significant relationship between knowledge of the physical environment and attitude towards waste disposal among university students. This meant that students' cognitive awareness levels of physical structures, facilities and equipment related to appropriate and inappropriate waste disposal practices, including an awareness of rules and regulations concerning inappropriate waste disposal practices in school has a connection with their waste disposal tendencies in school. The finding is supported by those of Akeh and Shehu (2018), Igudia and Agbonifoh (2019), Iyama, Edori and David (2020), Maphosa (2021), Amarachukwu, Evuti, Salam and Silas (2022), and Yusuf and

Fajri (2022) who all revealed that students' knowledge of the physical environment was connected with waste disposal attitudes in school.

Conclusion and Recommendation

Waste generation and disposal in schools is of concern in recent times due to the importance of higher education and the ever-increasing number of students who enrol for higher education. Inappropriate generation and disposal of waste has numerous consequences for persons within a given environment. Issues of flooding due to indiscriminate disposal in unauthorized spots, pollution of the natural environments (land, air and water-bodies), dirty environments serving as breeding grounds for disease causing agents, and health problems to human beings and even some animals as a result of the flooding and pollution are some consequences which have been proven to occur in the event of indiscriminate disposal of wastes. Investigating students' attitudes towards waste disposal could serve to bring about an understanding of how to enhance them adopt not only appropriate but best waste disposal practices. This is because an individual's attitude has a very significant influence on the person's behavioural intentions. In the event of impacting on an individual's attitude towards a specified action, the likelihood is that the person would practically act in line with the expected outcome. In other words, in the event of engaging students in activities that should make their attitude towards appropriate waste disposal more favourable, the more the likelihood that the students would practically engage in best waste disposal practices. On the other hand, in the event of no activities being created for the students to engage in towards appropriate waste disposal attitudes, they most likely would not develop favourable tendencies towards disposing waste appropriately, thus ensuring the prevalence of the consequences of indiscriminate waste disposal within the school's environs.

Based on the finding, it is recommended that students should be made to have more awareness of waste disposal methods in the school by the positioning of numerous banners and billboards indicating waste disposal methods deemed appropriate and those that are inappropriate within the school. Secondly, facilities and equipment related to appropriate and inappropriate waste disposal practices should be made available at strategic points in school, and awareness of rules and regulations concerning inappropriate waste disposal practices in school should be enforced.

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